Note 1: The shaft assembly consists of a main rotor shaft, P/N S1635–20059; an upper end plug, P/N S1635–20153; and a lower end plug, P/N S1635–20154. The shaft assembly P/N (S1635–20059–2) is marked on the edge of the main rotor shaft lower flange.

Note 2: This AD applies to each helicopter identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For helicopters that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must use the authority provided in paragraph (j) to request approval from the FAA. This approval may address either no action, if the current configuration eliminates the unsafe condition, or different actions necessary to address the unsafe condition described in this AD. Such a request should include an assessment of the effect of the changed configuration on the unsafe condition addressed by this AD. In no case does the presence of any modification, alteration, or repair remove any helicopter from the applicability of this AD.

Compliance: Required as indicated, unless accomplished previously.

To prevent failure of the main rotor shaft (shaft), loss of power to the rotor system, and subsequent loss of control of the helicopter, accomplish the following:

(a) From available helicopter records, determine the maximum number of actual operational cycles-per-hour of the current shaft assembly since installation. An operational cycle is defined as one turnaround (external lift cycle) for external load operations, and as one takeoff and one landing for internal load operations. A turnaround is defined as picking up an external load, transporting that load to a drop-off point, releasing the load, and flying to the next load pickup point. If the maximum number of actual operational cycles-per-hour cannot be determined, use 25-operational cycles-per-hour as the maximum operational cycles-per-hour for purposes of this AD. Record the determined number of operational usage cycles-per-hour of the shaft assembly in the appropriate aircraft maintenance records.

(1) If the maximum operational cycles-per-hour has ever equaled or exceeded 20 cycles-per-hour, inspect in accordance with paragraph (b) of this AD within the next 50 hours time-in-service (TIS), unless previously accomplished within the last 200 hours TIS.

(2) If the maximum operational cycles-per-hour has never exceeded 19 cycles-per-hour, inspect the shaft in accordance with paragraph (b) of this AD within the next 50 hours TIS, unless previously accomplished.

(b) Remove the shaft assembly, P/N S1635–20059–2, from the main gear box. Remove the upper end plug, P/N S1635–20153, and lower end plug, P/N S1635–20154, from the shaft assembly, and conduct a magnetic particle inspection (MPI) of the shaft for cracks in accordance with MIL–STD–1949 or ASTM E–1444. Pay particular attention to the inside diameter of the 0.7515 - 0.7510-inch diameter dowel pin holes in the flange and adjacent flange surfaces.

Note 3: Section 2D of Sikorsky Aircraft Alert Service Bulletin 58B35–34, dated June 9, 1995, contains a procedure for conducting a MPI of the shaft (in agreement with MIL-STD–1949 or ASTM E–1444).

(c) Conduct repetitive MPI's of the shaft for cracks as follows:

(1) If the maximum operational cycles-per-hour has ever equaled or exceeded 20 cycles-per-hour, repeat the MPI at intervals not to exceed 250 hours TIS from the date of the last inspection.

(2) If the maximum operational cycles-per-hour exceeds 6 cycles-per-hour, but has always been less than 20 cycles-per-hour, repeat the MPI at 1,250 hours TIS, and thereafter at intervals not to exceed 250 hours TIS from the date of the last inspection. If the last inspection was accomplished between 1,000 hours TIS and 1,250 hours TIS, begin the repetitive inspections within 250 hours TIS from the date of the last inspection instead of at 1,250 hours TIS.

(3) If the maximum operational cycles-per-hour has never exceeded 6 cycles-per-hour, repeat the MPI at 1,250 hours TIS. If the last inspection was accomplished between 1,000 hours TIS and 1,250 hours TIS, repeat the MPI within 250 hours TIS from the date of the last inspection instead of at 1,250 hours TIS.

(d) Report all inspection results to the Manager, Boston Aircraft Certification Office, using the Attachment provided later in this AD. Reporting requirements have been approved by the Office of Management and Budget and assigned OMB control number 2120–0056.

(e) If no crack is discovered, replace the upper and lower end plugs into the shaft and reinstall the shaft assembly into the main gearbox.

(f) If any crack is discovered or on or before the shaft assembly reaches 2,500 hours TIS, replace the shaft assembly with an airworthy shaft assembly, P/N S1635–20059–2. If the replacement shaft has previously been in service, determine the maximum operational cycles-per-hour in accordance with paragraph (a) and inspect in accordance with this AD.

Note 4: In accordance with the applicable maintenance manual, 2,500 hours TIS is the mandatory retirement life for the shaft assembly, P/N S1635–20059–2.

(g) If the main rotor shaft assembly installed on the helicopter has ever equaled or exceeded 20 or more operational cycles-per-hour, insert the following restrictions into the Limitations section of the Rotorcraft Flight Manual:

(1) For turbine engine installations: ''The main rotor shaft assembly installed on this helicopter has been operated at 20 or more cycles-per-hour. Engine power is restricted to maximum continuous power at 93%N_f. Takeoff power operations are prohibited.''

(2) For reciprocating engine installations: ''The main rotor shaft assembly installed on this helicopter has been operated at 20 or more cycles-per-hour. Engine power is restricted to maximum continuous power at 2,500 RPM. Takeoff power operations are prohibited.''

(h) If the main rotor shaft assembly installed on the helicopter has ever equaled or exceeded 20 or more operational cycles-per-hour, install on the instrument panel, adjacent to the pilot's engine (N_f or RPM) tachometer, torquemeter, or manifold pressure gauges, a placard made of material that is not easily erased, disfigured, or obscured that contains the following statement in lettering of 0.2 inch minimum height and stated in one or two lines:

(1) For turbine engine installations: ''MAX PWR: 101% Q AT 93% N_f''

(2) For reciprocating engine installations: ''MAX PWR: 47.5 IN. HG AT 2,500 RPM''

(i) Continue to record operational cycles-per-hour of the shaft assembly in the appropriate maintenance records. If operational cycles-per-hour increases on an affected shaft assembly to the extent that it places the shaft assembly into a higher cycles-per-hour usage group, the applicable requirements and limitations contained in this AD for the higher usage group apply to that shaft assembly. A replacement shaft assembly must comply with all requirements and limitations of this AD as applicable. If the number of operational cycles-per-hour determined for a replacement shaft assembly does not equal or exceed 20 cycles-per-hour, the Rotorcraft Flight Manual limitation specified in paragraph (g) and the placard required by paragraph (h) may be removed.

Note 5: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Boston Aircraft Certification Office.

(j) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used when approved by the Manager, Boston Aircraft Certification Office, FAA, New England Region. Operators shall submit their requests through an FAA Principal Maintenance Inspector, who may concur or comment and then send it to the Manager, Boston Aircraft Certification Office.

(k) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the helicopter to a location where the requirements of this AD can be accomplished.

(l) This amendment becomes effective on January 4, 1996.

Attachment

Inspection Results Report

The following information must be reported as soon as possible, but no later than 7 days after inspection, to: Manager, Boston Aircraft Certification Office, Engine and Propeller Directorate, Aircraft Certification Service, Federal Aviation Administration, 12 New England Executive Park, Burlington, MA 01803–5299, FAX: (617) 238–7199.

Operator/Repair Station _____
Aircraft Model No. _____
Aircraft Serial No. _____
Date of Inspection _____
Main Rotor Part No. _____
Main Rotor Serial No. _____

Type of Aircraft Utilization:
Passenger Carry _____
Firefighting _____
Utility/Construction _____
Logging _____
Other _____